EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	(modular exponentiation AND asymmetrical cryptosystem AND modulus AND ex ponent AND private key AND quantity AND equal$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2007/03/09 16:23
L3	287	(708/492).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 16:47
L4	265	(708/491).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 16:47
L5	286	(380/282).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 16:47
L8	140	(708/205).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 16:56
L9	5	Chinese Residue Theorem	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2007/03/09 17:08
L10	0	Chinese Residue Theorem and RCA	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2007/03/09 17:02

L11	1	Chinese Residue Theorem and decrypt$4 and encryp$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2007/03/09 17:03
L12	1	"5991415".pn.	USPAT	OR	OFF	2007/03/09 17:03
L15	199	(380/285).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 17:20
L16	1232	(380/30).CCLS.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 17:20
S1	3694	Seifert.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 14:55
S2	0	Seifert-Jean.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/05 13:52
S3	5	Velten-Joachim.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 17:12
S4	3	"7016500".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/05 14:29

S5	4	"789373".ap.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/09 16:23

Interference search

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	(modular exponentiation AND asymmetrical cryptosystem AND modulus AND ex ponent AND private key AND quantity AND equal$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	ON	2007/03/09 16:23

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IEEE JNL IEEE Journal or Magazine

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IEEE CNF IEEE Conference Proceeding

IET CNF IET Conference Proceeding

IEEE STD IEEE Standard

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☐ 1. **Residue-to-binary converters based on new Chinese remainder theorems**
Yuke Wang;
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☐ 2. **Cardiac resynchronization therapy**
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6. **Characteristics and scanning circuit of Camel CRT**
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Sung-Ming Yen; Seungjoo Kim; Seongan Lim; Sang-Jae Moon;
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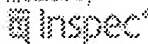
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From: Ruth E. Spink
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Ruth.spink@uspto.gov

Search Notes

April– Attached is the inventor, foreign patent and NPL search for the above referenced case. Be sure to contact me if you wish to refocus this search.

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S6         348     S MODULAR()EXPONENTIATION
S7       97332     S CRT OR CHINESE()RESIDUE()THEOREM
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14/5/1 (Item 1 from file: 349) **Links**
00915099
METHOD AND DEVICE FOR DETECTING A KEY PAIR AND FOR GENERATING RSA KEYS
PROCEDE ET DISPOSITIF POUR DETERMINER UNE PAIRE DE CLES ET POUR PRODUIRE DES CLES
RSA
VERFAHREN UND VORRICHTUNG ZUM ERMITTELN EINES SCHLUESSELPAARS UND ZUM
ERZEUGEN VON **RSA-SCHLUESSELN**

Patent Applicant/Patent Assignee:

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  DE; DE(Residence); DE(Nationality)
  (For all designated states except: US)
- **SEIFERT Jean-Pierre; Harsdoerfer Str. 1, 81669 Munchen**
  DE; DE(Residence); DE(Nationality)
  (Designated only for: US)

Patent Applicant/Inventor:

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  Harsdoerfer Str. 1, 81669 Munchen; DE; DE(Residence); DE(Nationality); (Designated only for: US)

Legal Representative:

- **SCHOPPE Fritz(et al)(agent)**
  Schoppe, Zimmermann, Stockeler & Zinkler, Postfach 71 08 67, 81458 Munchen; DE;

	Country	Number	Kind	Date
Patent	WO	200249266	A2-A3	20020620
Application	WO	2001EP14350		20011206
Priorities	DE	10061697		20001212

Designated States: (All protection types applied unless otherwise stated - for applications 2004+)

[EP] AT; BE; CH; CY; DE; DK; ES; FI; FR; GB;
GR; IE; IT; LU; MC; NL; PT; SE; TR;

[OA] BF; BJ; CF; CG; CI; CM; GA; GN; GQ; GW;
ML; MR; NE; SN; TD; TG;

[AP] GH; GM; KE; LS; MW; MZ; SD; SL; SZ; TZ;
UG; ZM; ZW;

[EA] AM; AZ; BY; KG; KZ; MD; RU; TJ; TM;

Main International Patent Classes (Version 7):

IPC	Level
H04L-009/30	Main

Publication Language: German
Filing Language: German
Fulltext word count: 3314

English Abstract:

The invention relates to a method for detecting a number pair comprising a first number and a second number. According to the inventive method, the first number is selected (100), said first number being a first key and the second number being a second key of an encryption system, the second number being the multiplicative inverse with respect to a module of the first number, and the module equaling the product from a first prime number and a second prime number. A first subnumber ($d"sub"p$) and a second subnumber ($d"sub"q$) are calculated for the second number (d) as the multiplicative inverse of the first number (e) with respect to a second submodule (120), the first submodule and the second submodule being relatively prime. Finally, the second number (d) is determined using the first subnumber ($d"sub"p$) and the second subnumber ($d"sub"q$) and applying the Chinese remainder theorem (130).

French Abstract:

L'invention concerne un procede pour determiner une paire de nombres comprenant un premier et un deuxieme nombre, le premier nombre pouvant etre une premiere cle et le deuxieme nombre une deuxieme cle d'un systeme de codage, et le deuxieme nombre etant l'inverse multiplicatif d'un module du premier nombre, ce module etant egal au produit d'un premier nombre premier et d'un deuxieme nombre premier. Selon ce procede, on commence par selectionner (100) le premier nombre, puis on calcule (110) un premier sous-nombre ($d"sub"p$) pour le deuxieme nombre (d) comme inverse multiplicatif du premier nombre (e) par rapport a un premier sous-module egal au premier nombre premier moins 1 divise par le plus grand denominateur commun (ggT) du premier nombre premier moins 1 et du deuxieme nombre premier moins 1. On calcule (120) ensuite un deuxieme sous-nombre ($d"sub"q$) pour le deuxieme nombre (d) comme inverse multiplicatif du premier nombre (e) par rapport a un deuxieme sous-module egal au deuxieme nombre premier (q) moins 1, le premier et le deuxieme sous-module etant relativement premiers. Pour finir, le deuxieme nombre (d) est determine (130) a l'aide du premier sous-nombre ($d"sub"p$) et du deuxieme sous-nombre ($d"sub"q$) au moyen du theoreme chinois des restes (CRT). En utilisant le theoreme chinois des restes, on transforme l'operation de formation des inverses multiplicatifs en deux operations correspondantes avec des nombres plus courts et une etape de combinaison rapide, si bien que l'on obtient une acceleration de facteur 4 comparativement a un procede ne faisant pas appel au theoreme chinois des restes.

Type	Pub. Date	Kind	Text
Publication	20020620	A2	Without international search report and to be republished upon receipt of that report.
Search Rpt	20021227		Late publication of international search report
Republication	20021227	A3	With international search report.
Examination	20030213		Request for preliminary examination prior to end of 19th month from priority date

PCT FULLTEXT
00884964
METHOD AND DEVICE FOR CARRYING OUT A MODULAR EXPONENTIATION IN A CRYPTOGRAPHIC PROCESSOR
PROCEDE ET DISPOSITIF PERMETTANT D'EXECUTER UNE EXPONENTIATION MODULAIRE DANS UN PROCESSEUR CRYPTOGRAPHIQUE
VERFAHREN UND VORRICHTUNG ZUM DURCHFUHREN EINER MODULAREN EXPONENTIATION IN EINEM KRYPTOGRAPHISCHEN PROZESSOR

Patent Applicant/Patent Assignee:

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  DE; DE(Residence); DE(Nationality)
  (For all designated states except: US)

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  DE; DE(Residence); DE(Nationality)
  (Designated only for: US)

- **SEIFERT Jean-Pierre; Harsdorfer Str. 1, 81669 Munchen**
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  (Designated only for: US)

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  Harsdorfer Str. 1, 81669 Munchen; DE; DE(Residence); DE(Nationality); (Designated only for: US)

Legal Representative:

- **SCHOPPE Fritz(et al)(agent)**
  Postfach 71 08 67, 81458 Munchen; DE;

	Country	Number	Kind	Date
Patent	WO	200219065	A2	20020307
Application	WO	2001EP9285		20010810
Priorities	DE	10042234		20000828

Designated States: (All protection types applied unless otherwise stated - for applications 2004+)

[EP] AT; BE; CH; CY; DE; DK; ES; FI; FR; GB;
GR; IE; IT; LU; MC; NL; PT; SE; TR;

Main International Patent Classes (Version 7):

IPC	Level
G06F-001/00	Main
G06F-007/72	

Publication Language: German
Filing Language: German
Fulltext word count: 4032

English Abstract:

French Abstract:

Type	Pub. Date	Kind	Text
Publication	20020307	A2	Without international search report and to be republished upon receipt of that report.
Declaration	20020926		Late publication under Article 17.2a
Republication	20020926	A2	With declaration under Article 17(2)(a); without abstract; title not checked by the International Searching Authority.
Examination	20021128		Request for preliminary examination prior to end of 19th month from priority date

PCT FULLTEXT

00516888

CODE EXCHANGE PROTOCOL
PROTOCOLE D'ECHANGE DE CODES

Patent Applicant/Patent Assignee:

- **SIEMENS AKTIENGESELLSCHAFT**;
  ; ;

- **VON DER HEIDT Guido**;
  ; ;

- **SoHNE Peter**;
  ; ;

- **VELTEN Joachim**;
  ; ;

	Country	Number	Kind	Date
Patent	WO	9948240	A1	19990923
Application	WO	99DE771		19990318
Priorities	DE	19811833		19980318

Designated States: (All protection types applied unless otherwise stated - for applications 2004+)

Main International Patent Classes (Version 7):

IPC	Level
H04L-009/08	Main

Publication Language: German
Filing Language:
Fulltext word count: 1498

English Abstract:

The invention relates to a code exchange protocol in which communication partners (A, B) each have a secret code (S) and a public code (P). According to the invention, communication partner (A) selects a random number (x), and communication partner (B) selects a random number (y). A first partial code (Ax) is formed by communication partner (A), and a second partial code (By) is formed by communication partner (B) by using the public code (P) of the respective partner (B, A). Each partial code is transmitted to the other communication partner (B, A). A session code (gxy, gyx) is formed from each of the personal random numbers (x, y) and from the partial code (By, Ax) of the respective communication partner (B, A) by using the personal secret code (S), whereby the partial codes (Ax, By), and the session codes (gxy, gyx) can be calculated in a manner which is analogous to the Diffie-Hellman protocol.

French Abstract:

L'invention concerne un protocole d'echange de codes dans lequel des correspondants (A, B) possedent respectivement un code secret (S) et un code public (P), le correspondant (A) composant un nombre aleatoire (x) et le correspondant (B) composant un nombre aleatoire (y). Un premier code partiel (Ax) est forme par le correspondant (A), et un deuxieme code partiel (By) est forme par le correspondant (B) a l'aide du code public (P) du correspondant respectif (B, A), ce premier code et ce deuxieme code etant transmis respectivement a l'autre correspondant (B, A). Un code de session (gxy, gyx) est forme respectivement a partir du nombre aleatoire personnel (x, y) et du code partiel (By, Ax) du correspondant respectif (B, A), a l'aide du code secret (S) personnel, le code partiel (Ax, By) et le code de session (gxy, gyx) etant calcules par analogie avec le protocole de Diffie-Hellman.

Derwent WPIX
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0012395983 *Drawing available*
WPI Acc no: 2002-339681/200237
XRPX Acc No: N2002-267108
Method for production of security module with virtual memory addressing uses provision of 2 security modules having different mapping specifications
Patent Assignee: INFINEON TECHNOLOGIES AG (INFN)
Inventor: SEDLAK H; **SEIFERT J**

Patent Family (5 patents, 93 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
WO 2002019065	A2	20020307	WO 2001EP9285	A	20010810	200237	B
DE 10042234	A1	20020314	DE 10042234	A	20000828	200237	E
DE 10042234	C2	20020620	DE 10042234	A	20000828	200239	E
AU 200187675	A	20020313	AU 200187675	A	20010810	200249	E
AU 2001287675	A8	20050922	AU 2001287675	A	20010810	200570	E

Priority Applications (no., kind, date): DE 10042234 A 20000828

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes	
WO 2002019065	A2	DE	26	5		
National Designated States,Original	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW					
Regional Designated States,Original	AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR					
AU 200187675	A	EN			Based on OPI patent	WO 2002019065
AU 2001287675	A8	EN			Based on OPI patent	WO 2002019065

Alerting Abstract WO A2
NOVELTY - The method uses provision of a first security module with a first mapping specification for mapping logical addresses onto physical addresses and provision of a second security module with a second mapping specification, which is different to the first mapping specification, with random provision of the first or the second mapping specification.
DESCRIPTION - Also included are INDEPENDENT CLAIMS for the following:

A. a security module with virtual memory addressing;
B. a device for production of a security module with virtual memory addressing;
C. a method for configuring a security module with a virtual memory address

USE - The method is used for production of a security module with virtual memory addressing.
ADVANTAGE - The stored information is stored in different physical addresses at 2 different points in time for increasing the protection of the security module from attack.
DESCRIPTION OF DRAWINGS - The figure shows a flow diagram for production of a security module with virtual memory addressing. (Drawing includes non-English language text).

Title Terms /Index Terms/Additional Words: METHOD; PRODUCE; SECURE; MODULE; VIRTUAL; MEMORY; ADDRESS; PROVISION; MAP; SPECIFICATION

Class Codes

International Patent Classification

IPC	Class Level	Scope	Position	Status	Version Date
G06F-001/00; H04L-009/30			Main		"Version 7"
G06F-007/58; G06F-007/72			Secondary		"Version 7

File Segment: EPI;
DWPI Class: T01
Manual Codes (EPI/S-X): T01-H01A; T01-H01C2; T01-H03A; T01-J12C

DE 59906682	G	DE			Application	EP 1999919098
					PCT Application	WO 1999DE771
					Based on OPI patent	EP 1062763
					Based on OPI patent	WO 1999048240
US 7016500	B1	EN			PCT Application	WO 1999DE771
					Based on OPI patent	WO 1999048240

Alerting Abstract WO A1

NOVELTY - Communications partner A selects random number x and partner B selects number y. Subcodes Ax for partner A and By for partner B are set up by using a public code P. Each subcode is transmitted to the other partner. Sessions codes gxy and gyx are set up from both the random numbers x and y and from subcodes Ax and By by using a personal secret code S. This allows subcodes Ax and By along with session codes gxy and gyx to be calculated to match the Diffie-Hellman protocol.

USE - In end-to-end authentification. In encoding procedures, coding devices and tamper-proof devices.

ADVANTAGE - The encoding procedure requires little computation, since little exponential application is needed.

Title Terms /Index Terms/Additional Words: CODE; EXCHANGE; PROTOCOL; COMMUNICATE; PARTNER

Class Codes

International Patent Classification

IPC	Class Level	Scope	Position	Status	Version Date
H04L-009/08; H04L-009/30			Main		"Version 7"
G09C-001/00			Secondary		"Version 7
H04L-0009/00	A	I	F	B	20060101

US Classification, Issued: 380282000, 380030000, 380046000, 713171000

File Segment: EngPI; EPI;
DWPI Class: T01; W01; P85
Manual Codes (EPI/S-X): T01-D01; T01-J12C; W01-A05A; W01-A05B

1/5/1 **Links**
Derwent WPIX

0013194811 *Drawing available*
WPI Acc no: 2003-278924/200327
XRPX Acc No: N2003-221446
Calculation of the result of a modular exponentiation to increase RSA-CRT calculation security against cryptographic attacks by randomization of the auxiliary exponents or alteration of the sub- modules
Patent Assignee: INFINEON TECHNOLOGIES AG (INFN)
Inventor: SEIFERT J; SEIFERT J P; VELTEN J

Patent Family (7 patents, 100 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
WO 2003023605	A2	20030320	WO 2002EP9405	A	20020822	200327	B
DE 10143728	A1	20030403	DE 10143728	A	20010906	200330	E
EP 1423786	A2	20040602	EP 2002797920	A	20020822	200436	E
			WO 2002EP9405	A	20020822		
DE 10143728	B4	20040902	DE 10143728	A	20010906	200457	E
AU 2002333678	A1	20030324	AU 2002333678	A	20020822	200460	E
US 20040215685	A1	20041028	WO 2002EP9405	A	20020822	200471	E
			US 2004789373	A	20040227		
CN 1554047	A	20041208	CN 2002817557	A	20020822	200517	E

Priority Applications (no., kind, date): DE 10143728 A 20010906

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes	
WO 2003023605	A2	DE	24	3		
National Designated States,Original	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW					
Regional Designated States,Original	AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SK SL SZ TR TZ UG ZM ZW					
EP 1423786	A2	DE			PCT Application	WO 2002EP9405
					Based on OPI patent	WO 2003023605
Regional Designated States,Original	AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR					
AU 2002333678	A1	EN			Based on OPI patent	WO 2003023605
US 20040215685	A1	EN			Continuation of application	WO 2002EP9405

```
Set      Items     Description
S1       1806      S AU=(SEIFERT, J? OR SEIFERT J?)
S2        828      SELECT AU= "SEIFERT, J" OR AU= "SEIFERT, J."
S3         40      SELECT AU= "SEIFERT, J.-P." OR AU= "SEIFERT, J.P."
S4         19      SELECT AU= "SEIFERT, JEAN-PIERRE"
S5        582      SELECT AU= "SEIFERT J"
S6         23      SELECT AU= "SEIFERT J P" OR AU= "SEIFERT JP"
S7          7      SELECT AU= "SEIFERT JEAN-PIERRE"
S8       1499      S S2:S7
S9         91      S AU=(VELTEN, J? OR VELTEN J?)
S10      1590      S S8 OR S9
S11     35550      S (PUBLIC OR SECRET OR PRIVATE OR ENCRYPT? OR CRYPT?)()KEY? ? OR PKI OR
CRYPTOKEY? ? OR CRYPTKEY? ? OR PERMITKEY? ? OR ACCESSKEY? ? OR KEYPAIR? ? OR
ASYMMETRIC?()CRYPTOGRAPHY
S12    791626      S ENCRYPT? OR CIPHER? OR CYPHER? OR CRYPTO? OR ENCIPHER? OR ENCYPHER? OR
ENCOD?
S13      7451      S S12 AND (RSA OR CRT)
S14         3      S CHINESE()RESIDUE()THEOREM
S15      1875      S CHINESE()REMAINDER()THEOREM
S16       375      S RIVEST()SHAMIR()ADLEMAN
S17      1118      S MODULAR()EXPONENTIATION
S18        38      S S10 AND (S11 OR S13 OR S14 OR S15 OR S16 OR S17)
S19         9      S S18 NOT PY>2001
S20         5      RD (unique items)
  ; show files
```

[File 8] **Ei Compendex(R)** 1884-2007/Feb W4
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*File 94: UD200609W2 is the last update for 2006. UD200701W1 is the first update for 2007. The file is complete
and up to date.*

[File 111] **TGG Natl.Newspaper Index(SM)** 1979-2007/Mar 05
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[File 434] **SciSearch(R) Cited Ref Sci** 1974-1989/Dec
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[File 34] **SciSearch(R) Cited Ref Sci** 1990-2007/Mar W1

[File 62] **SPIN(R)** 1975-2007/Feb W3

[File 99] **Wilson Appl. Sci & Tech Abs** 1983-2007/Feb

[File 95] **TEME-Technology & Management** 1989-2007/Mar W1

[File 56] **Computer and Information Systems Abstracts** 1966-2007/Feb

[File 57] **Electronics & Communications Abstracts** 1966-2007/Feb

[File 60] **ANTE: Abstracts in New Tech & Engineer** 1966-2007/Feb

[File 266] **FEDRIP** 2007/Feb

[File 583] **Gale Group Globalbase(TM)** 1986-2002/Dec 13
File 583: This file is no longer updating as of 12-13-2002.

[File 239] **Mathsci** 1940-2007/Apr

20/5/1 (Item 1 from file: 2) **Links**

08087050   **INSPEC Abstract Number:** B2001-12-6120D-066, C2001-12-1260C-037
Title: Using fewer qubits in Shor's factorization algorithm via simultaneous Diophantine approximation
Author Seifert, J.-P.
Author Affiliation: Infineon Technol., Munich, Germany
Conference Title: Topics in Cryptology - CT-RSA 2001. The Cryptographers' Track at RSA Conference 2001.
Proceedings (Lecture Notes in Computer Science Vol.2020)   p. 319-27
Editor(s): Naccache, D.
Publisher: Springer-Verlag , Berlin, Germany
Publication Date: 2001 **Country of Publication:** Germany   xii+471 pp.
ISBN: 3 540 41898 9   **Material Identity Number:** XX-2001-01772
Conference Title: Topics in Cryptology - CT-RSA 20001
Conference Sponsor: Compaq Comput. Corp.; Hewlett-Packard; IBM; Intel Corp.; Microsoft; nCipher ; EDS; et al
Conference Date: 8-12 April 2001   **Conference Location:** San Francisco, CA, USA

Language: English   **Document Type:** Conference Paper (PA)
Treatment: Theoretical (T)

Abstract: While quantum computers might speed up in principle certain computations dramatically, in practice, though quantum computing technology is still in its infancy. Even we cannot clearly envision at present what the hardware of that machine will be like. Nevertheless, we can be quite confident that it will be much easier to build any practical quantum computer operating on a few number of quantum bits rather than one operating on a huge number of quantum bits. It is therefore of big practical impact to use the resource of quantum bits very sparingly, ie, to find quantum algorithms which use as few as possible quantum bits. Here, we present a method to reduce the number of actually needed qubits in Shor's algorithm to factor a composite number N. Exploiting the inherent probabilism of quantum computation we are able to substitute the continued fraction algorithm to find a certain unknown fraction by a simultaneous Diophantine approximation. While the continued fraction algorithm is able to find a Diophantine approximation to a single known fraction with a denominator greater than $N/sup 2/$, our simultaneous Diophantine approximation method computes in polynomial time unusually good approximations to known fractions with a denominator of size $N/sup 1+$ epsilon $/$, where epsilon is allowed to be an arbitrarily small positive constant. As these unusually good approximations are almost unique we are able to recover an unknown denominator using fewer qubits in the quantum part of our algorithm. (26 Refs)

 Subfile: B C
Descriptors: computational complexity; number theory; **public key** cryptography; quantum computing; quantum cryptography
Identifiers: Shor factorization algorithm; simultaneous Diophantine approximation; quantum computers; quantum computing; quantum bits; quantum algorithms; qubits; probabilism; continued fraction algorithm; polynomial time
Class Codes: B6120D (Cryptography); B0250 (Combinatorial mathematics); C1260C (Cryptography theory); C4270 (Quantum computing theory); C1160 (Combinatorial mathematics)

20/5/2 (Item 2 from file: 2) <u>Links</u>

07670476   **INSPEC Abstract Number:** B2000-09-6120D-039, C2000-09-1260C-022

Title: Extending Wiener's attack in the presence of many decrypting exponents

Author Howgrave-Graham, N.; **Seifert, J.-P.**

Author Affiliation: Math. Sci. Dept., Bath Univ., UK

Conference Title: Secure Networking - CQRE [Secure]'99. International Exhibition and Congress. Proceedings (Lecture Notes in Computer Science Vol.1740)   p. 153-66

Editor(s): Baumgart, R.

Publisher: Springer-Verlag , Berlin, Germany

Publication Date: 1999 **Country of Publication:** Germany   ix+258 pp.

ISBN: 3 540 66800 4   **Material Identity Number:** XX-2000-00034

Conference Title: Secure Networking - CQRE [Secure]'99

Conference Date: 30 Nov.-2 Dec. 1999   **Conference Location:** Dusseldorf, Germany

Language: English   **Document Type:** Conference Paper (PA)

Treatment: Theoretical (T)

Abstract: Wiener (1990) has shown that when the **RSA** protocol is used with a decrypting exponent, d, which is less than $N^{1/4}$ and an **encrypting** exponent, e, approximately the same size as N, then d can usually be found from the continued fraction approximation of e/N. We extend this attack to the case when there are many e_i for a given N, all with small d_i. For the case of two such e_i, the d_i can (heuristically) be as large as $N^{5/14}$ and still be efficiently recovered. As the number of **encrypting** exponents increases the bound on the d_i, which enables efficient recovery of the d_i, increases (slowly) to $N^{1-\epsilon}$. However, the complexity of our method is exponential in the number of exponents present, and therefore only practical for a relatively small number of them. (12 Refs)

 Subfile: B C

Descriptors: protocols; **public key cryptography**

Identifiers: decrypting exponents; **RSA** protocol; **encrypting** exponent; fraction approximation; exponential complexity; **public key cryptography**

Class Codes: B6120D (Cryptography); C1260C (Cryptography theory); C6130S (Data security)

20/5/3 (Item 3 from file: 2) <u>Links</u>
INSPEC
07576378   **INSPEC Abstract Number: B2000-06-6120D-020, C2000-06-1260C-019**
Title: Tensor-based trapdoors for CVP and their application to public key cryptography
Author Fischlin, R.; **Seifert, J.-P.**
Author Affiliation: Fachbereich Math., Frankfurt Univ., Germany
Conference Title: Cryptography and Coding. 7th IMA International Conference. Proceedings (Lecture Notes in Computer Science Vol.1746)   p. 244-57
Editor(s): Walker, M.
Publisher: Sprnger-Verlag , Berlin, Germany
Publication Date: 1999 **Country of Publication:** Germany   ix+312 pp.
ISBN: 3 540 66887 X   **Material Identity Number:** XX-1998-03682
Conference Title: Proceedings of 7th Conference on Cryptography and Coding
Conference Date: 20-22 Dec. 1999   **Conference Location:** Cirencester, UK

Language: English   **Document Type:** Conference Paper (PA)
Treatment: Theoretical (T)
Abstract: We propose two trapdoors for the closest-vector-problem in lattices (CVP) related to the lattice tensor product. Using these trapdoors we set up a lattice-based cryptosystem which resembles the McEliece scheme. (26 Refs)
 Subfile: B C
Descriptors: lattice theory; **public key** cryptography; tensors; vectors
Identifiers: tensor-based trapdoors; **public key** cryptography; closest-vector problem; lattice tensor product
Class Codes: B6120D (Cryptography); B0210 (Algebra); C1260C (Cryptography theory); C1110 (Algebra)
 Copyright 2000, IEE

20/5/4 (Item 1 from file: 144) **Links**
 Fulltext available through: USPTO Full Text Retrieval Options   ScienceDirect
Pascal

15333989 `PASCAL No.: 02-0020666

Information leakage attacks against Smart card implementations of the
elliptic curve digital signature algorithm
 E-smart 2001 : smart card programming and security : Cannes, 19-21
September 2001

ROEMER Tanja; **SEIFERT Jean-Pierre**
 ATTALI Isabelle, ed; JENSEN Thomas, ed
 Infineon Technologies Corporation Security & ChipCard ICs Technical
Innovations, 81609 Munich, Germany
 International conference on research in smart cards (Cannes FRA)
2001-09-19
 Journal: Lecture notes in computer science,
2001, 2140 211-219

In this article we will be concerned with a polynomial-time attack
against the ECDSA, which computes the **secret key** of the ECDSA
if a few bits of the ephemeral-key from several ECDSA-signatures are known.
The number of needed bits per signature is 12, if one has access to an
ideal lattice basis reduction algorithm computing the nth
successive minimum of a lattice with rank n. The aforesaid bits of the
ephemeral-key can be obtained from insecure ECDSA implementations by so
called side-channel-attacks like Timing, Simple-Power-Analysis,
Differential-Power-Analysis, Electromagnetic or Differential-Fault attacks.
Our attack combines a recent idea of Howgrave-Graham and Smart with an old
lattice attack against linear congruential pseudo-random number generators
due to Frieze, Hastad, Kannan, Lagarias und Shamir. In contrast to
Howgrave-Graham and Smart, our approach enables the exact determination of
the number of needed (side-channel) bits and uses an easier lattice problem
making the attack very practical.

English Descriptors: Cryptanalysis; Fault diagnostic; Timing; Elliptic
  curve; Intelligent system; Digital signature; Smart cards; Polynomial
  time; Lattice

French Descriptors: Cryptanalyse; Diagnostic panne; Timing; Courbe
  elliptique; Systeme intelligent; Signature numerique; Carte a puce; Temps
  polynomial; Treillis; Smart card

Classification Codes: 001D04A04E

20/5/5 (Item 1 from file: 239) <u>**Links**</u>
Mathsci
03301702 **MR** 2002h#94079
Tensor-based trapdoors for CVP and their application to public key cryptography (extended abstract).

Cryptography and coding (Cirencester, 1999)

Fischlin, Roger (Department of Mathematics, Johann Wolfgang Goethe-Universitat Frankfurt, D-60054 Frankfurt am Main, Germany)

 Seifert, Jean-Pierre (Department of Mathematics, Johann Wolfgang Goethe-Universitat Frankfurt, D-60054 Frankfurt am Main, Germany)
Corporate Source Codes: D-FRNK; D-FRNK

 1999 ,

Springer, Berlin, ;   244--257, ,

Series: Lecture Notes in Comput. Sci., 1746,

Language: English   **Summary Language:** English

Document Type: Proceedings Paper

Journal Announcement: 200203

Subfile: MR (Mathematical Reviews) AMS

Abstract Length: SHORT (4 lines)

Summary: ``We propose two trapdoors for the closest-vector problem in lattices related to the lattice tensor product. Using these trapdoors we set up a lattice-based cryptosystem which resembles the McEliece scheme."
 \{For the entire collection see MR 2002d:94047.\}

Reviewer: Summary

Review Type: Abstract

Proceedings Reference: 2002d#94047 ; 1 861 825

Descriptors: * 94A62 -Information and communication, circuits-Communication, information- Authentication and secret sharing

```
Set       Items     Description
S1        15291     S (PRIVATE OR SECRET)()KEY? ? OR ASYMMETRIC?()CRYPTOGRAPHY
S2          346     S MODULAR()EXPONENTIATION
S3        73049     S CRT OR CHINESE().(RESIDUE OR REMAINDER)()THEOREM
S4          442     S (EIGHTH OR 8TH ) (3W) (QUANTITY OR QUANTITIES OR SUM OR SUMS OR TOTAL? ?
OR RESULT? ? )
S5         2807     S PRIME()NUMBER? ?
S6        26273     S (RANDOM OR PSEUDORANDOM)()(NUMBER? ? OR INTEGER? ? OR VALUE? ?)
S7         5806     S (SAFETY OR SECURITY) () (PARAMETER? ? OR NUMBER? ? OR VALUE? ?)
S8            0     S S1 (50N) S2 (50N) S3 (50N) S4 (50N) S5 (50N) S6 (50N) S7
S9         2387     S (AUTHORI? OR AUTHENTICAT?)() (PARAMETER? ? OR NUMBER? ? OR VALUE? ?)
S10           0     S S1 (50N) S2 (50N) S3 (50N) S4 (50N) S5 (50N) S6 (50N) S9
S11           0     S S1 (50N) S2 (50N) S4 (50N) S5 (50N) S6 (50N) (S7 OR S9)
; show files
```

[File 348] **EUROPEAN PATENTS** 1978-2007/ 200708

File 348: For important information about IPCR/8 and forthcoming changes to the IC= index, see HELP NEWSIPCR.

[File 349] **PCT FULLTEXT** 1979-2007/UB=20070308UT=20070301

File 349: For important information about IPCR/8 and forthcoming changes to the IC= index, see HELP NEWSIPCR.

[File 350] **Derwent WPIX** 1963-2006/UD=200716

File 350: DWPI has been enhanced to extend content and functionality of the database. For more info, visit http://www.dialog.com/dwpi/.

```
Set        Items     Description
S1          1613     S (PRIVATE OR SECRET)()KEY? ? OR ASYMMETRIC?()CRYPTOGRAPHY
S2             2     S MODULAR()EXPONENTIATION
S3             0     S S1 AND S2
  ; show files
```

[File 347] **JAPIO** Dec 1976-2006/Nov(Updated 070228)

```
Set       Items    Description
S1        8870     S (PRIVATE OR SECRET)()KEY? ? OR ASYMMETRIC?()CRYPTOGRAPHY
S2        1118     S MODULAR()EXPONENTIATION
S3        35826    S CRT OR CHINESE()(RESIDUE OR REMAINDER)()THEOREM
S4        361      S (EIGHTH OR 8TH ) (3W) (QUANTITY OR QUANTITIES OR SUM OR SUMS OR TOTAL? ?
OR RESULT? ? )
S5        12337    S PRIME()NUMBER? ?
S6        26182    S (RANDOM OR PSEUDORANDOM)()(NUMBER? ? OR INTEGER? ? OR VALUE? ?)
S7        3431     S (SAFETY OR SECURITY) () (PARAMETER? ? OR NUMBER? ? OR VALUE? ?)
S8        0        S S1 AND S2 AND S3 AND S4 AND S5 AND S6 AND S7
S9        166      S (AUTHORI? OR AUTHENTICAT?) () (PARAMETER? ? OR NUMBER? ? OR VALUE? ?)
S10       0        S S1 AND S2 AND S3 AND S4 AND S5 AND S6 AND S9
S11       0        S S1 AND S2 AND S4 AND S5 AND S6 AND (S7 OR S9)
; show files
```

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[File 35] **Dissertation Abs Online** 1861-2007/Feb
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[File 2] **INSPEC** 1898-2007/Feb W4
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[File 94] **JICST-EPlus** 1985-2007/Mar W2
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File 94: JICST will be removed from all vendors on March 31, 2007. Please contact the Knowledge Center for alternative files.

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[File 99] **Wilson Appl. Sci & Tech Abs** 1983-2007/Feb
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[File 95] **TEME-Technology & Management** 1989-2007/Mar W1

[File 56] **Computer and Information Systems Abstracts** 1966-2007/Feb

[File 57] **Electronics & Communications Abstracts** 1966-2007/Feb

[File 60] **ANTE: Abstracts in New Tech & Engineer** 1966-2007/Feb

[File 266] **FEDRIP** 2007/Feb

[File 583] **Gale Group Globalbase(TM)** 1986-2002/Dec 13
File 583: This file is no longer updating as of 12-13-2002.

[File 239] **Mathsci** 1940-2007/Apr

```
Set      Items    Description
S1       15284    S (PRIVATE OR SECRET)()KEY? ? OR ASYMMETRIC?()CRYPTOGRAPHY
S2         131    S MODULAR()EXPONENTIATION
S3       85255    S CRT OR CHINESE()(RESIDUE OR REMAINDER)()THEOREM
S4        3168    S (EIGHTH OR 8TH ) (3W) (QUANTITY OR QUANTITIES OR SUM OR SUMS OR TOTAL? ?
OR RESULT? ? )
S5        3525    S PRIME()NUMBER? ?
S6       12815    S (RANDOM OR PSEUDORANDOM)()(NUMBER? ? OR INTEGER? ? OR VALUE? ?)
S7       66283    S (SAFETY OR SECURITY OR AUTHORI? OR AUTHENTICAT?) () (PARAMETER? ? OR
NUMBER? ? OR VALUE? ?)
S8           0    S S1 (50N) S2 (50N) S3 (50N) S4 (50N) S5 (50N) S6 (50N) S7
S9           0    S S1 (50N) S2 (50N) S4 (50N) S5 (50N) S6 (50N) S7
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... 46 6.1.1 Distinction between a **security** problem and a reliability problem . . . .
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The OAKLEY Key Determination Protocol (RFC2412)

1998-11-01   IPCOM000002988D   English (United States)

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